

METHOD AND SYSTEM FOR CHARGING A SET ACTIVATION FEE FOR PAY TELEPHONE USAGE

TECHNICAL FIELD

10 The present invention relates to the field of telephony, and more particularly to a method for charging a set activation fee to a pay telephone customer calling from a remote area.

BACKGROUND

15 In today's society, the telephone is a common instrument. People use telephones to communicate in many different environments. Indeed, the telephone is nearly omnipresent and used by millions of people. Even public locations typically have a pay telephone within easy walking distance to provide access to the public switched telephone network.

20 However, providing land-line based telephone service to certain remote locations is not economically feasible. The cost of installing a pay telephone includes running a line, setting up a local switch, and installing the actual pay telephone. Sometimes these costs drastically exceed the potential revenues of the pay telephone. Typically, the
25 provider of a pay telephone receives only a nominal fee for each call placed from the pay telephone. If the installation of a pay telephone is not economically feasible, then there is no incentive to provide pay telephone service at the remote location.

30 Current solutions to this problem remain unsatisfactory. Cellular technology suffers from problems similar to land-line based telephony. The cost of erecting cellular transmission towers may also be too

5 expensive to justify providing service. Microwave connections require sophisticated, specialized equipment. This leaves service providers with no options for extending coverage to all those who desire pay telephone service.

For example, providing telephone service to an oil derrick at sea
10 may be economically prohibitive. The derrick would not only require a telephone but a transmission path to the Public Switched Telephone Network (PSTN). The number of telephone calls placed from the derrick using traditional billing methods would never generate enough revenue to pay for the cost of providing the pay telephone service in this example.
15 Other remote locations suffer similar problems. These problems persist in any environment where significant expenditures are required to provide service.

Thus, there is a need in the art for an economically feasible method to provide pay telephone service to even the most isolated locations.
20 There is a further need in the art for a system which allows a service provider to recoup the costs of providing access to a public switched telephone network via a pay telephone.

SUMMARY OF THE INVENTION

25 Generally stated, the invention provides a system and method for charging a set activation fee for a telephone call. A set activation fee pay telephone permits a telephone customer to place a telephone call from the telephone if the customer presents valid billing information. The set activation fee pay telephone charges a predetermined fee to the

5 customer's telephone bill or other bill, if the customer presents valid
billing information, or deducts the fee from value present on a stored
value card. When a customer picks up the set activation fee pay
telephone's handset, a false dial tone is generated. To the customer, the
false dial tone is indistinguishable from the dial tone generated by the
10 PSTN.

The set activation pay telephone accepts two inputs: a telephone
number the customer desires to call and billing information. The billing
information may consist of a credit card number, a smart telephone card,
a calling card, or other approved information. The set activation fee pay
15 telephone stores the telephone number locally and transmits the billing
information to a network element, such as a service control point (SCP)
which could include a Line Identification Database (LIDB).

In one embodiment, the SCP maintains a billing database
containing the billing information approved for use with the set activation
20 fee pay telephone. Upon receipt of a customer's billing information from
the set activation fee pay telephone, the SCP determines whether any
billing database entry matches the billing information. If an entry
corresponds to the billing information, the SCP transmits an approval
signal to the set activation fee pay telephone. Otherwise, the SCP
25 transmits a denial signal and a message is played to the customer
informing him that the call may not be placed.

Once the SCP approves the billing information, the set activation
fee pay telephone releases the false dial tone and seizes the dial tone
generated by the public switched telephone network. The pay telephone

5 then passes the called telephone number stored in memory to the PSTN,
and the call is placed normally. The set activation fee pay telephone
monitors the call parameters while the telephone call is in progress,
including the length of the call, the time of the call, and the call
destination. Once the customer terminates the call, the set activation fee
10 pay telephone stores the call parameters for use in billing the call. At
predetermined intervals, the set activation fee pay telephone collates and
transmits the call parameters to a network element, such as the SCP, or to
a billing agent's database. A network element, such as an SSP or a
billing agent then computes the total charge for the call and adds the call
• 15 cost to the customer's bill, along with a set activation fee reflecting the
cost for the use of the set activation fee pay telephone.

The present invention satisfies the identified needs by providing a
method for a service provider to add a set activation fee to any telephone
calls made from a set activation fee pay telephone. By adding a set
20 charge to a telephone call placed from a set activation fee pay telephone,
regardless of the length of the call or other call-variant factors, a service
provider may defray the costs of providing service to a public switched
telephone network.

25 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 displays a portion of a public switched telephone network.

Fig. 2 is a logic flow diagram illustrating a method for charging a
pay telephone customer a set activation fee.

5 DETAILED DESCRIPTION

 The present invention permits a telephone service provider to offset costs incurred to provide pay telephone service to remote locations by charging a set activation fee to a customer. A set activation fee is a flat fee charged to a customer, regardless of call type, in order to offset a portion of the cost of providing telephone service. The set activation fee is charged for operator-assisted or toll-free calls, as well as regular telephone calls. Briefly described, the invention validates billing information prior to placing a telephone call and charges a set activation fee for each call placed and completed. In one embodiment, the invention utilizes a set activation fee pay telephone that will not place a telephone call unless valid billing information is presented by the user.

 A customer initiates a telephone call from a set activation fee pay telephone by dialing a telephone number associated with a terminating element such as a telephone, cellular telephone, or modem, and inputting billing information. The set activation fee pay telephone stores the dialed telephone number and forwards the billing information for validation. A network element receives the billing information, and determines whether the billing information is valid. For example, the billing information can be validated by determining whether the billing information is present in a database of preapproved billing information.

 Once the set activation fee pay telephone receives the approval signal, it accesses the public switched telephone network and places a telephone call to the telephone number the customer dialed. At the termination of the telephone call, the set activation fee pay telephone

5 stores the call parameters for transmission to the network element that provides billing capability. At some predetermined interval the call parameters are transmitted to a database associated with the network element, at which time the set activation fee is added to the customer's bill.

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Operation of a Store and Forward Telephone

A store and forward telephone is well-known to those skilled in the art of telephony. Current store and forward pay telephones perform a store and forward operation only in response to "zero-plus" dialing. 15 Zero-plus dialing occurs when a customer places a telephone call by dialing zero, plus a telephone number. A store and forward operation is not performed when a customer places a telephone call by dialing a toll-free number, such as an 800 number. A store and forward telephone prompts the customer to enter credit card information or other billing 20 information in order to bill the cost of the telephone call to a valid account.

The store and forward telephone stores both the dialed number and the billing information, and transmits the billing information for validation. If the billing information is validated, an accept response is transmitted to the store and forward telephone. Otherwise, a rejection 25 response is transmitted and the store and forward telephone terminates the telephone call. If the store and forward telephone receives an accept response, then the telephone call is placed and the cost of the telephone call is added to the caller's account.

5 In one embodiment, a modified store and forward telephone may be used to implement the present invention. Specifically, a modified store and forward telephone performs a store and forward operation for all calls placed from the telephone. Additionally, the modified store and forward telephone is identified as a set activation fee pay telephone.

10 **Description of the Exemplary Operating Environment**

Referring now to the drawings, in which like numerals indicate like elements throughout the several figures, the embodiments of the present invention will be described below with reference to the appended
15 drawings. Generally, Fig. 1 illustrates the operating environment of an embodiment of the present invention. Fig. 2 illustrates the logical operation of an embodiment of the present invention.

Fig. 1 is a diagram depicting a representative portion of the public switched telephone network (PSTN) 95. Generally, the public switched
20 telephone network is comprised of a variety of interconnected computer systems. The representative portion of the public switched telephone network 95 in Fig. 1 comprises a Service Management System (SMS) 10, a Service Control Point (SCP) 20, a Service Transfer Point (STP) 30, Service Switching Point (SSP) 40, and a Service Node (SN) 50.

25 The SMS 10 performs the high-level operations of the telephone network. The functions of the SMS 10 include: (a) downloading information to SCP 20 databases, such as database 60 when new subscribers are added or subscribers modify their ensemble of services; (b) performing data reloads when a SCP 20 crashes or software needs to be updated; (c)

5 implementing high volume routing services, such as call forwarding and
800 number translation and routing; (d) maintaining and providing access
to high volume databases for the authorization of billing, such as credit
card number validations; and (e) downloading, on a non-real-time basis,
10 billing information that is needed in order to appropriately invoice
telephone company subscribers for the services provided.

The SCP 20 and the SMS 10 are interfaced over a digital data link
110. The SCP 20 operates in the telephone network to maintain a network
database 60 that stores subscriber information. The subscriber
information supports enhanced services, such as call forwarding. The SN
15 50 and the SMS 10 are interfaced over a digital data link 150. An SSP
typically interfaces to an SN via an ISDN link such as ISDN link 151
between SSP 40 and SN 50. However, the present invention does not
require an ISDN link between the SSP and the SN. Generally, SSPs
operate by transmitting signal messages or queries to other components
20 and by receiving and processing response messages from the other
components. A signal message indicates an event or a state change has
occurred at an SSP. When a set of predetermined conditions are detected,
the SSP 40 operates to (a) initiate a signal associated with the specific call
processing state for the present call on a subscriber line, (b) generate and
25 transmit an appropriate query message to another network component,
and (c) suspend call processing for the present call until a response is
received from the component. The received response message instructs
the SSP 40 to take certain actions in processing the present call. If the

5 SSP 40 does not receive a response from the network component, a default task will be executed upon the expiration of a default timer.

Additionally, the SSP 40 typically generates a billing record for each terminating element attached thereto in a manner well-known to those skilled in the art. Briefly, the SSP 40 creates pre-communication
10 accounting records for communications originating on the subscriber line 170. Each of these accounting records typically includes the subscriber's directory number, the terminating station directory number, and the duration of the telephone call placed from the terminating element on the subscriber line and a terminating station. The accounting records created
15 by the SSP 40 for the subscriber line 170 are periodically downloaded to a billing system on a non-realtime basis. The billing system (not shown) then computes the costs for the communications represented by the various accounting records and prepares billing statements to be mailed to the subscriber.

SSPs may also be connected to each other via a trunk circuit (not shown). The trunk circuits provide the physical voice paths between parties. Each SSP 40 services several subscriber lines. SSP 40 is shown as interfacing with termination equipment 70 and 70' via subscriber lines 170 and 170'. STPs in the network are utilized in linking the SSPs to the
25 SCP 20s. In Fig. 1, SCP 20 interfaces to STP 30 via digital data line 120 and STP 30 interfaces with SSP 40 via digital data link 130. Digital data packets flowing between the SCP 20 and the SSP 40 goes through STP 30. Thus, the STP 30 is not normally the destination of a packet, but merely directs traffic among the other entities on the network that

5 generate and respond to the data packets. The public switched telephone network 95 can also interface to a non-SSP switch, a cellular network, or a private telephone system.

It should be noted that the preferred operating environment of the present invention is not limited to the relatively simple configuration shown in Fig. 1. Rather, Fig. 1 shows an illustrative portion of the PSTN 95 sufficient to describe an embodiment of the invention and its operation. Many other network elements and interconnections, including SSP and non-SSP switches for servicing other pieces of terminating equipment (for example, cellular telephones) are not shown in Fig. 1, but will be understood to be appropriate for use with the present invention.

Charging a Set Activation Fee

Continuing with Fig. 1, an exemplary embodiment of the present invention is discussed. Set activation fee pay telephone 70 is connected to the public switched telephone network 95 via a standard subscriber line 170. When a customer initially picks up the handset of the set activation fee pay telephone 70, the telephone does not relay the dial tone generated by the PSTN 95. Instead, the set activation fee pay telephone 70 simulates a dial tone. This is referred to as a false dial tone, because the tone is provided by the set activation fee pay telephone, rather than the PSTN. The false dial tone is generated in order to fulfill the customer's expectation that a dial tone will be present upon picking up the handset.

So long as the set activation fee pay telephone 70 plays a false dial tone, no telephone calls may be placed. In order to access the PSTN 95

5 from the set activation fee pay telephone 70, a customer must enter both a telephone number and billing information, in a manner similar to placing a call with a calling card. Optionally, the set activation fee pay telephone 70 may provide voice prompts to assist a customer in entering this information. Effectively, the pay telephone 70 is inactive and will not
10 access the PSTN 95 until the telephone receives an approval and activation signal from a network element, such as the SSP 40. The billing information may comprise a calling card number, credit card number, or other information through which the network element may identify the caller and bill the caller the set activation fee for the use of the pay
15 telephone. Alternatively, if the set activation pay telephone is equipped to process smart cards, then a smart card can be used and the billing transaction is completed by the set activation pay telephone without involvement of other network elements.

The set activation fee pay telephone 70 stores the telephone
20 number in local memory storage and transmits the directory number for the set activation fee pay telephone and the billing information across a subscriber line 170 to the SSP 40. The SSP 40 then passes the billing information and the directory number associated with the set activation fee telephone to another network element responsible for maintaining a
25 billing database 80. In Fig. 1, the billing database 80 is associated with the SCP 20. However, in alternate embodiments the database may be associated with other network elements, such as the SMS 30 or SSP 40. For example, the SSP 40 can maintain a billing database for set activation fee billing for all terminating elements connected to the SSP. It should be

5 understood that these are representative network elements, rather than an exhaustive list of all network elements capable of maintaining the billing database 80. Alternatively, billing information may be stored in the set activation fee pay telephone itself, and then transmitted at periodic intervals to a final billing database.

10 Database 80 is associated with a network element, such as SCP 20, as illustrated by Fig. 1. Although not shown in Fig. 1, in an alternative embodiment the billing database 80 may be associated with the SMS 10 and receive periodic updates from the SCP 20 or SSP 40. The billing database 80 differs from the database 60 described above insofar as the
15 billing database 80 stores records of billing information preapproved for use with a set activation fee pay telephone 70 and a list of all telephones configured to charge a set activation fee. Alternatively, billing database 80 could be split into two separate databases. The first database may store billing information records, while the second may store a set
20 activation fee pay telephone list. As will be apparent to those skilled in the art, the billing database 80 (or a portion of the database) could be combined with an existing database in a network element.

Billing information is preapproved if the service provider can verify that it may bill an account associated with the billing information
25 for use of the pay telephone. Examples of billable accounts include valid credit card accounts, telephone billing accounts for valid calling card accounts, and other accounts that will be readily apparent to those skilled in the art. Generally, an account is valid if the account is active and meets certain pre-defined criteria.

5 When a telephone call is placed from a set activation fee pay
telephone 70, the network element determines whether the billing
information is present in the billing database 80. If the network element
finds a corresponding entry for the billing information in the billing
database 80, then the network element transmits an approval signal to the
10 set activation fee pay telephone 70. Upon receipt of the approval signal
by the set activation fee pay telephone, the SSP 40 releases call
processing capabilities for the set activation fee pay telephone 70. The
SSP then relays the approval signal to the pay telephone 70.

15 In response to receipt of the approval signal, the set activation fee
pay telephone 70 accesses the PSTN 95, playing a "true" dial tone
generated by the PSTN. Once the true dial tone is accessible, the pay
telephone 70 retrieves the telephone number from memory storage and
places a telephone call to the number. During the telephone call, the set
activation fee pay telephone 70 monitors various call parameters,
20 including call length, call origination time, and the number called. Upon
call termination, the set activation fee pay telephone 70 stores the call
parameters. The set activation fee pay telephone transmits the stored call
parameters to billing database 80 or another external billing database at a
predetermined interval. The billing database creates a record that may be
25 used to compute the total cost of the telephone call. Alternately, the set
activation fee pay telephone 70 may compute the total cost of the
telephone call and transmit this information directly to the billing
database 80. The network element or the set activation fee pay telephone
adds the call charge to the customer's account, and adds a separate line

5 item to the bill called a “set activation fee.” The set activation fee is a
fixed charge assessed to a caller reflecting the cost of providing service
from the telephone’s location. This fee does not vary with any of the call
parameters listed above, but instead is always the same set amount. Note
that this amount may vary by telephone. For example, the set activation
10 fee associated with a first set activation fee pay telephone at a first
location may be different than the set activation fee associated with
another set activation fee pay telephone at a second location, because the
cost of providing service to the first location is different than the cost for
providing service to the second location.

15 Optionally, the network element may not charge a customer
anything for the call itself based on the call parameters, but will always
charge the set activation fee. For example, a telephone call may be
placed from a set activation fee pay telephone 70 using a toll-free
telephone number. In this event, the network element may not assess any
20 call charges based on the location called or length of the call.
Nonetheless, the set activation fee is still charged, insofar as the set
activation fee reflects the cost of providing telephone service to the pay
telephone itself.

25 Flowchart of Steps for Charging a Set Activation Fee

Fig. 2 displays a flowchart detailing the steps executed when
placing a telephone call from a set activation fee pay telephone 70. The
method begins in step 200, wherein the set activation fee pay telephone

5 provides a false dial tone to the customer. Following step 200, step 202 is accessed.

In step 202 a customer places a telephone call from the set activation fee pay telephone by dialing a directory number associated with a terminating unit. The set activation fee pay telephone issues a
10 prompt for billing information entry. Next, in step 205 the customer enters the customer's billing information. Typically, the billing information consists of a credit card number, telephone smart card number, or calling card number, although other types of billing information also may be used. For example, if the set activation fee pay
15 telephone includes a card reading device, then the customer can "swipe" a card through the card reading device to provide the billing information.

In step 210, the pay telephone 70 stores the billing information and dialed telephone number in internal memory. The set activation fee pay telephone 70 plays an announcement (for example, "Thank you for using
20 BellSouth") to a customer while the billing information is passed to the PSTN and validated, as described in steps 225 through 235.

In step 225, the pay telephone transmits the billing information to the SSP 40, which in turn transmits the billing information to the SCP 20. The exemplary SCP 20 shown in Fig. 1 includes a database containing
25 the billing information which may be used with the invention. Although the SCP 20 carries out the following steps in the embodiment depicted on Fig. 2, alternative embodiments may have various network elements perform these functions, as discussed with respect to Fig. 1.

5 Following step 225, step 230 is entered. In step 230, the SCP 20 determines whether the billing information matches an entry in the database. If it does, then the customer's billing information is approved for use with the set activation fee pay telephone, and step 232 is entered. If the SCP 20 does not find a matching entry, then the billing information
10 is invalid and step 235 is accessed.

 In step 235, the pay telephone 70 plays a message to the customer stating that the billing information is invalid, and that the call may not be placed. Once this message is played, end step 270 is accessed.

 In the event that the SCP 20 found an entry corresponding to the
15 billing information in the database, then step 232 is entered. In step 232, the SCP 20 transmits an approval signal to the pay telephone 70. This approval signal instructs the pay telephone to release the false dial tone and seize a true dial tone from the PSTN, as shown in step 240.

 Once the true dial tone is seized in step 240, the set activation fee
20 pay telephone 70 places the call across the PSTN in step 245. Following the call placement, step 250 is entered. In step 250, the set activation fee pay telephone monitors the call parameters, such as the length of the call, the call destination, and the time of the call. Alternatively, network elements may be used to monitor the call parameters. These parameters
25 can affect the amount charged for the call. The pay telephone monitors these parameters until the call is terminated.

 Termination of the telephone call initiates step 255. In step 255, the set activation fee pay telephone passes the call parameters to the SCP 20 via the SSP 40, as shown in step 255. Once the SCP 20 receives the

5 call parameters transmitted in step 255, the SCP 20 computes the charge for the call. In an alternative embodiment, the SCP 20 may create a billing record used by another network element or a dedicated billing system to compute and bill charges. Although Fig. 2 illustrates that the call parameters are transmitted once the telephone call terminates, the call
10 parameters can be stored and transmitted at predetermined intervals.

In step 257, the SCP 20 recognizes that the originating telephone number is associated with a set activation fee pay telephone 70. Following step 257, the SCP adds the set activation fee to the customer's bill in step 260. Alternatively, the SCP 20 may transmit the billing record
15 to the network element responsible for billing charges to a caller's account. The network element in turn processes the billing record and changes a caller's account accordingly. As part of adding a charge to the customer's bill, the SCP 20 adds an additional line item reflecting a fee for the use of the set activation fee pay telephone 70. This fee is called
20 the "set activation fee," and is broken out as a separate line item on the customer's bill. Alternatively, the set activation fee pay telephone 70 can compute the charge for the call by adding the set activation fee to the cost of the telephone call. After step 260, end state 270 is entered.

25 Conclusion

The set activation fee pay telephone 70 may include additional functionality; for example, the telephone may store the billing information in local memory along with the dialed telephone number, or may be operative to accept a wider range of billing information than

5 herein described. It should also be understood that the set activation fee
pay telephone 70 and billing database 80 may be located in different
regions of the PSTN 95, rather than within the same locality as shown in
Fig. 1. In this event, STP 30 communicates with a different regional STP
(not shown) and so on, until the region in which the SCP 20 is located is
10 reached. Many other modifications and additional features will become
evident in view of the preceding description of the embodiments of the
invention. It should be understood, therefore, that the foregoing
description relates only to certain embodiments of the invention, and that
numerous changes may be made therein without departing from the spirit
15 and scope of the invention as defined by the following claims.